diphtheria. If present results are not so good as early investigations warranted, a reëxamination of our methods is indicated.

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RURAL OBSTETRICS*

SOME COMMENTS ON ONE THOUSAND DELIVERIES

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DISCUSSION *by T. B. Beatty, M. D., Salt Lake City; Ralph J. Thompson, M. D., Los Angeles; Lyle G. McNeile, M. D., Los Angeles.*

SOME of the lay journals of the United States seem to be whipping themselves into a frenzy over the poor expectant mothers. The contributors to these lay publications elaborate on the great danger the mothers go through, the enormous cost of bringing the new citizens into this world, and according to most of these writers these faults are largely laid at the feet of the doctors. Some medical writers, by way of variety, blame the general practitioner for all of it.

If these contentions are true it is time we took stock, for there is a wide variation between present reported, and ideal mortality rates. With this thought in mind, I have gone over my own and also the obstetric records of my associates, Doctors Marshall and Aldous, for the last ten years. In this paper I wish to submit our statistics in proof that the country woman is not so badly off as she has been pictured, and that the country doctor should not be blamed for all of the bad results in obstetrics.

SCOPE OF THIS ANALYSIS WHICH INCLUDES ONE THOUSAND OBSTETRICAL CASES

This paper will present a discussion of home delivery procedures, meeting obstacles that come up under such conditions, with particular reference to actual experience in what might be called a cross section of the general population of a state presenting social and economic environments such as are found in Utah.

Number of Patients Included in This Analysis. This report covers one thousand deliveries, in which series there was the loss of one mother. The patients who required hospitalization are included, though we did not do the work of actual delivery. There were five such patients who were sent to the hospital.

Complications.—One patient died because of premature separation of the placenta at eight months, there being no dilation and the patient being pulseless when we saw her. There were two complete lacerations in spontaneous vertex deliveries, blotting paper type. There were three in breech deliveries, all primiparae. Four with satisfactory repair, one with some sphincter unreliability. Two sections were done in women with grossly deformed pelves. Two patients with severe infections were sent to the hospital, one of the patients having a pelvic abscess and the other a septic type of infection; both patients recovered. One antepartum fever patient and one preëclamptic patient were sent to the hospital, but each had a normal puerperium and a live baby. There were twelve patients who required uterine packing for control of hemorrhage. Five patients had breast abscesses in the first six weeks after delivery.

There were no deaths from abortions or miscarriages in our experience, but we have not included such complications in this report, as we wished to record statistics for only full-time patients.

As near as I can judge, 10 per cent of the patients required versions, forceps, or other obstetrical operations. I have no record of morbidity among these one thousand patients, but think about 75 per cent of the patients could be so included if we took a temperature of 99, or a pulse over 80 as the deciding factors.

CONDITIONS UNDER WHICH THESE WOMEN WERE CARED FOR

With the exception of five hospital patients already noted, these patients were delivered in home surroundings, such as in homesteaders' dirt-floored cabins, or in Japanese boarding houses, or wherever we found them. All races except negroes seemed to be included, for a smelter mining town draws all classes and types of workers. These patients were scattered over one hundred square miles of Tooele County, but most of the patients lived in Tooele, which is a community of about five thousand population.

We have never been called upon to treat a patient with eclampsia.

There is a scale in our office and each woman was weighed, and a urine specimen was examined every three weeks up to the seventh month, then every ten days. This work was done by the office nurse. If a patient showed any abnormality, she was told to wait for examination by one of the doctors.

The usual examination was made when a patient first called at our office. Her normal weight was ascertained; and if she added more than twenty-five pounds to that weight before her delivery time arrived, she was politely told by the nurse that she need not return, as she had broken her contract with the doctors. Under such conditions we found that the patients were generally

* Read before the Salt Lake County Medical Society, Salt Lake, Utah.

back in a week with the necessary poundage practically off. We have never lost a patient by this method, but have gained a good many through the advertising which a fasting primipara broadcasts. Because of the high incidence of goiter in Utah, these patients were given iodin all through pregnancy and were warned against sexual intercourse after the sixth month, and given such other advice as seemed called for in special instances.

SPECIAL PREPARATIONS FOR DELIVERY

Two weeks before delivery each patient sent to our office a bundle, consisting of one sheet, three diapers, one pound of cotton, and five yards of gauze. The cotton and gauze were worked up into vulvar pads and packed in a paper sack so that when one was removed it was only handled in one place, and the side so handled was placed away from the vulva. The whole bundle was wrapped in paper and placed in the office sterilizer and kept at fifteen pounds pressure for thirty minutes. The sterilizer used was a thirty-dollar national type, and could be used on a hot plate, a heating stove, or a gas jet. The bundle was labeled and put in a storage room in our office, and if not used at the time expected, it was resterilized. This work was done by our office nurse.

At the time of delivery we were accompanied by a trained nurse if one was available; if not, by some handy woman. If the nurse attended, the patient was charged $5 extra for her services.

We carried in addition to the usual rubber gloves, gown, etc., one pair of short and one pair of long-armed rubber gloves, which had been dry-sterilized; some J. & J. uterine packing strips, and several pads of sterile sponges which were prepared by our office assistant. If the patient was a primipara, she was examined per rectum and, if labor was not progressing too fast, was given one-eighth grain of morphin in an H. M. C. tablet, in a two cubic centimeters of 50 per cent magnesium sulphate solution. This treatment usually insured us all a peaceful night, and we were practically certain that the head would be resting on the perineum when the doctor arrived six hours later, or sometimes in the bed, if we were a little slow in starting our automobile. The patient was prepared at the first visit by the nurse and gloves were boiled, so we lost no time upon arrival. In immediate preparation for delivery the patient was shaved as gently as possible. The vulvae were painted with a two per cent mercurochrome in 50 per cent alcohol. We did not wash the vulvar tissues, no matter how dirty, because of the danger of infecting the vagina with dirty water.

METHOD USED IN THE DELIVERIES

An ordinary Kelly pad was placed under the woman, with ten or twelve thicknesses of newspaper over it, so that if the bag of waters broke the bed would not be soiled. When the head appeared at the vulvar orifice, fresh papers and a sterile diaper were placed in the pad and a sterile sheet was draped over the woman; and another sterile diaper was placed on some papers on the other side of the bed within easy reach for the reception of the baby. Chloroform was used exclusively on account of the frequent close proximity of heating stoves, and we gauged the amount of chloroform used by watching the drops poured on the mask. We tried rectal anesthesia and gas, but have almost given them up because of the extra attendance necessary to make them successful, and because a blue baby is hard to explain to others when it is shown in the home of the patient. When the labor was rapid, we also used chloroform while the head was passing through the cervix, in order to avoid cervical tears. When the head was about ready to deliver in primiparae, we did a double lateral episiotomy of only one-fourth inch depth through the skin and mucous membrane, which gave us much more room at the outlet. The small size of the episiotomy made unnecessary the use of stitches. The head was delivered under complete anesthesia. A hypodermic injection of pituitrin was administered to all patients at once.

When the baby was delivered it was placed on the sterile diaper, the cord was tied, etc., and the infant was taken away from the bed. A slop jar was placed near the foot of the bed, and an ordinary china cup, which had been boiled, was placed in the pad to catch the discharges from the vulvae. These were dipped up and poured in the slop jar, thus giving us an accurate check on the amount of blood lost. After an interval of fifteen minutes, a newspaper was placed over the top of the slop jar and the placenta was delivered, if ready, and was placed on the papers. This procedure broke the sterile technique, because both hands were now contaminated. After this procedure, the fundus of the uterus was held for another fifteen minutes, the woman meanwhile having been given a dram of ergot by mouth. If any other work was indicated, such as stitches, or arresting of bleeding, the extra pair of dry sterile gloves were used.

After we were sure of the postpartum action of the uterus the gloves were removed and the baby's eyes were treated with a one per cent silver nitrate solution and the cord was inspected. The attending doctor's gown and mask were clean but not sterile (short-sleeved gowns being used). The nurse usually had the baby dressed by this time, and if she was an untrained helper she was shown how to apply a vulvar pad, without contamination, and was instructed in the usual method of cleansing the vulvae without the use of washrags. As helpers or assistants we insisted on having women who had been trained by ourselves, or women who knew absolutely nothing about deliveries, for we found a little learning to be a dangerous thing.

Laundry was a real item in this work and in most instances two diapers and one sheet were the extent of it, which created a good impression on the housekeeper.

The mothers were up on a back rest the second day and were permitted out of bed when the

fundi could no longer be felt. The mothers were given instructions to exercise extensively in knee, chest, and monkey-walk positions. Breasts were left entirely alone, except for binders, and exposed to air as much as possible and bathed with boric acid solution before and after nursing. The importance of a postpartum examination was stressed, both for the benefit of the patient and also to permit us to check our results at the sixth week. And last, but not least, at that time it was a good occasion to settle the account for professional services which had been rendered.

COMMENT

We did vaginals of course, when necessary, under the best technique possible; and used forceps if the progress of the head was arrested for an hour, as we preferred forceps to pituitrin, believing that women are better off than to have the presenting parts pound away for hours until the mother is completely exhausted. All perineal tears were sewed up at once, but we never touched a cervix except to examine it when persistent hemorrhage was present.

I might add, considering the great cry which is nowadays made about the cost of medical care, that the charges per baby (including nursing, doctor, housekeeper, and incidentals), rarely exceeded the sum of $65.

CONCLUSIONS

On the subject of obstetric practice in rural communities such as I have described, I have arrived at the following conclusions:

Every young physician starting to do general practice, and particularly obstetrics in rural communities, should be associated with an older physician who has had a large experience along that line. I feel that my association with older men in my early years of practice was of inestimable value to me; and in turn I have been able, I hope, to counsel the young men with whom I have been associated to their advantage, because I believe that even our present-day system of a general intern year does not give sufficient preparation for this kind of work.

Any country doctor, if he is practicing obstetrics because he likes the work (and not because he must in order to hold his families), can show results in low mortality rates that will measure up most favorably to the rates in general hospitals. For, as I see it, other things being equal, a woman's own bed is not at all a bad place for her in which to have a baby.

DISCUSSION

T. B. Beatty, M. D. (Health Commissioner, State of Utah, Salt Lake City).—Doctor Peck is to be congratulated on the remarkable showing set forth in his report of one thousand deliveries with a single maternal death. The results are the more striking when the statistics of maternal deaths in Utah are taken into consideration. The official records of the State Board of Health show that the average urban death rate (cities exceeding 10,000 population) for the five-year period, 1918 to 1922 inclusive, was 9.8 per 1000 live births. For the five-year period, 1923 to 1927 inclusive, the rate was 7.5 per 1000 births. The rural maternal death rates covering the same periods were, 1918 to 1922 inclusive, 6.4, and 1923 to 1925 inclusive, 4.2, which was the lowest rate in the United States.

There is certainly food for thought in the comparison. Doctor Peck seems to have solved the problem of making childbirth safe for mothers in rural districts. His technique is rational and leaves little to criticize, as proved by the results. While it must be admitted that conditions in a well-conducted maternity hospital are more convenient and favorable for safeguarding the mother, Doctor Peck has demonstrated that it is not essential, and that the most important factor is a qualified medical attendant and the proper technique. I question whether the average general hospital affords as favorable conditions as home care in the hands of a competent obstetrician.

In my opinion the educational activities in behalf of maternity and infancy that have been carried on by the Utah State Board of Health for a seven-year period, aided by funds received from the federal government, have been a distinct factor in the 35 per cent reduction of the rural maternal death rate. Many expectant mothers have been reached by monthly letters covering advice appropriate to each month of pregnancy, in which the importance of early consultation with the attending physician and proper hygienic measures have been stressed.

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Ralph J. Thompson, M. D. (College of Medical Evangelists, 312 Boyle Avenue, Los Angeles).—Doctor Peck's article on rural obstetrics is most interesting, and his technique of handling these cases in the homes good. Apparently the end results measure up favorably with those of any well-equipped and organized hospital.

One of the best parts of this paper is the results obtained from the regular routine prenatal care. The fact that they have not treated a single case of eclampsia in the past ten years is without question due to these periodic examinations of the urine, and careful weighing of each patient, with the proper instructions as to diet.

The author's description of the special preparations made for each delivery in the home and the careful technique followed is surely responsible for his low morbidity record. The anesthetic used exclusively being chloroform on account of the close proximity of the heating stoves in the home is a good practice, although I believe ether for obstetrical anesthesia would probably be just as safe an anesthetic if properly handled, even under these conditions. I believe Doctor Peck is right in considering that rectal anesthesia requires extra time and attention, and I believe that this type of anesthesia should not be given to the patient in the home unless a skilled attendant is present to watch the progress of labor. The double lateral episiotomy of one-fourth inch depth which he uses in primiparae no doubt prevents deeper lacerations, but I believe the tissues should be approximated by the proper sutures.

I would consider immediate care of the baby's eyes of most importance, and this can be done in every case, even before the cord is ligated, while the child is still on the bed, or across the abdomen of the mother. As the usual custom is to wait for the pulsation of the cord to cease before it is ligated, it is well to properly cleanse the nose and throat of the child of all mucus and treat the eyes immediately.

As Doctor Peck's paper did not deal with infant mortality, we are not able to say what injury the child suffers by the hypodermic injection described. One would naturally expect to find not infrequently rather deep lacerations of the mother and possibly an asphyxiated child in the bed, if handled in this way.

Doctor Peck is to be highly complimented on this very good paper, and were all maternity cases in the homes cared for in as careful a way there is no question but that the results of these deliveries would measure up very favorably with those of any of the general hospitals.

LYLE G. MCNEILE, M. D. (Director Los Angeles City Health Department Maternity Service, Los Angeles). This paper reports a series of patients delivered in the home, not under favorable conditions, but nevertheless with an extremely low morbidity and mortality. The results are an example of what can be done in rural obstetrics. The author and his associates have carefully considered every modern discovery and aid which is commonly accepted, and with great ingenuity and common sense have adapted them to the conditions under which they work. This is a paper which can be read with advantage by any practitioner who practices obstetrics.

The Los Angeles Maternity Service, an out-patient obstetrical service coöperating with the Los Angeles City Health Department and organized for the purpose of caring for needy women in their own homes, operates under practically the same conditions. Doctor Peck has emphasized routine urinalysis, and the prevention of too rapid gain of weight during pregnancy as the greatest factors of prenatal care. We feel that in addition to these very important measures the blood pressure should be taken at each regular visit. We believe that a Wassermann test should be done on every obstetrical case. Doctor Peck has not stressed the necessity of a complete physical examination at the first visit. The time consumed in a careful examination of the nose, throat and teeth, heart, lungs and pelvis is small as compared to the satisfaction in "picking up" those focal infections which are probably the most important factors in the etiology of certain toxemias of pregnancy, cardiac and lung conditions which are adversely affected by pregnancy, and pelvic conditions which are likely to seriously affect the course of labor or the puerperium. The author points out that it is absolutely essential that the patient be seen at regular frequent intervals during pregnancy. It is extremely bad practice to fail to insist that this be done.

Doctor Peck in his technique has provided for sterile supplies for every patient. We furnish similar supplies in copper containers, which are cleaned, refilled and resterilized when used. We do not believe that the mercurochrome used in Doctor Peck's preparation has any effect because of the large amount of surface fat on the tissues of the vulvar region. Careful observations and controlled cases have demonstrated to our satisfaction that a 3½ per cent tincture of iodin preparation, sponged off with iodin-alcohol, is more satisfactory.

While there is a widespread feeling in the United States against the use of chloroform, I feel that its danger has been greatly overestimated. It should not be used if there is any evidence of toxemia, or in the presence of cardiac or renal complications. I agree most heartily with Doctor Peck that, except under unusual conditions, pituitary extract should not be used before delivery on account of the danger of injury to both the baby and the maternal soft parts.

In the United States twenty-five thousand women die annually from the results of childbirth. Competent observers believe that the basic method used to reduce this high mortality must be early complete examination and supervision during the whole period of pregnancy combined with conservative and aseptic care during labor and adequate after-care. The Los Angeles Maternity Service, caring for poor women in their own homes, under the most adverse conditions, during the first ten years gave prenatal care to 14,155 patients and delivered 7285. The maternal mortality was one death in 910 deliveries. The infant mortality was one death in twenty-three deliveries (this including all stillbirths, and all deaths during the first ten days). All premature babies from the fifth month of pregnancy were included. The technique and methods used were very similar to those described by Doctor Peck.

PEPTIC ULCERS—DIAGNOSIS AND TREATMENT*

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SO much direct and indirect criticism of medical treatment of peptic ulcers has been indulged in recently that I wish to point out the confusion which has arisen over the misuse of the term "medical treatment," and to show, from the statistical studies of peptic ulcer treated in the Southern Pacific Railroad Hospital, that when properly carried on, medical treatment of uncomplicated ulcer is the method of choice; and, on the other hand, that many of the complications cannot be considered amenable to treatment by any method but surgery. The important point in the situation is the matter of complete diagnosis and a clinical investigation into the part played by the complication in preventing cure or contributing to recurrence.

ETIOLOGY

There is no direct proof of the etiology of chronic peptic ulcer in man. It has not been difficult to produce acute ulcer by experiment in animals and, although these ulcers are quite unlike those found in man, the presumptive evidence is full of suggestion as to etiology of chronic ulcers in human beings.

In 1903 Lorenzi noted hemorrhage in gastric mucous membrane in animals whose pneumogastric nerves were sectioned below the diaphragm, and if the animals survived over twenty-four hours, mucous erosions were found. Sarlta later showed that adding three per cent hydrochloric acid resulted in these erosions becoming ulcers.

Van Yzeren in 1901 reported such pneumogastric resection in twenty rabbits, with the occurrence of chronic pyloric ulcer in ten. Seven of the remainder died within five days, whereas ulcer developed in the earliest of those who survived, in seven days.

Ophüls of Stanford repeated these experiments on thirty rabbits and found ulcer developing in one rabbit after twenty-four days. The twelve examined before that showed no ulcer, whereas one-third of those examined after twenty-four days had ulcers.

More recently, Singer [1] has discussed injury to the vagus as a cause of duodenal ulcer and the rôle of affections of the vagus in the development of gastric ulcer.

Rodov [2] has presented an illuminating discussion of the biological relation of gastric ulcer and the vegetative system. Roller from his work in Ortner's clinic confirms Pollak's findings of ulcer as a sequence to vagus disease in the course of chronic encephalitis and reports ulcer from vagus inflammation from proximity to tuberculous mediastinal glands, in the gastric crises of tabes where it is common, and in a case of in-

* From the records of the Southern Pacific Hospital, San Francisco.
* Read before the Pacific Association of Railway Surgeons, Reno, Nevada, August 23-24, 1929.